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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/017,847

12/14/2001

Grzegorz J. Kusinski

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EXAMINER

LEROY, DAVID H

ART UNIT

PAPER NUMBER

1742

DATE MAILED: 01/29/2003

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/017,847

Applicant(s)

KUSINSKI ET AL. SM #3

Examiner

David H. LeRoy

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 13-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 6-8 and 12 is/are rejected.
- 7) ☒ Claim(s) 3-5, 9-11 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-12, drawn to alloy carbon steel, classified in class 148, subclass 320.
 - II. Claims 13-22, drawn to a method for manufacturing alloy carbon steel, classified in class 148, subclass 540.

Inventions Group I and Group II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product could be made by mixing ferritic stainless steel powder with an austenitic+martensitic duplex stainless steel powder and sintering using hot isostatic pressing.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with M. Henry Heines on 12/9/02 a provisional election was made with traverse to prosecute the invention of Group 1, claims 1-12. Affirmation of this election must be made by applicant in replying to this Office action. Claims 13-22 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter that the applicant regards as his invention.

2. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 12, the phrase "containing substantially no carbides" is confusing since "substantially no carbides" should be interpreted differently than viewed in the light of the definition on page 5 lines 32-page 6 line 2 of instant specification. Applicant appears to intend a functional limitation wherein the limit of carbide present is somehow set as an amount having "no detrimental effect on the performance characteristics" of the alloy as defined. This also raises a question as to whether applicant is referring to no carbides between interfaces as in claim 2. Applicant needs to clarify the claim language concerning the carbides, their location or non-location, and the amount of carbide having non-detrimental effect on the performance characteristics.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States

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Crystallography of carbide precipitation at transformation interfaces during austenite decomposition in a low-alloy steel. Law et al. Materials Science and Technology, 3 (8), 642-8, 1987.

3. Claims 1, 2, 6, and 7 are rejected under 35 U.S.C. 102(b) as being unpatentable over Law et al.

Law et al. anticipates the claimed low alloy steel having the thin films of retained interlath austenite in untransformed martensite and transformation of austenite to ferrite (See abstract top of page 642 and Introduction in col. 1 page 642). Law et al. disclose alloy compositions containing carbon contents of 0.25-0.40 wt. % (See Table 1 in col. 2 page 642 and Figure 1). The overlapping carbon range is 0.25-0.35 wt.% or 0.25-0.3 wt.% (See MPEP 2131.03). Law et al. discuss interphase precipitation of carbides during transformation of the austenite, in lath austenite-untransformed martensite, and in ferrite (See col.2 page 642 – col. 1 page 643). When discussing transformation, Law et al. disclose interlath films of retained austenite in retained martensitic areas and abutting the ferrite (See "Ferrite reaction" col.1-col. 2 page 643). Law et al. identifies no carbide precipitates at interfaces between the martensitic-austenitic phases. This is interpreted as martensitic-austenitic interfaces being devoid of carbides as in the claimed invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Crystallography of carbide precipitation at transformation interfaces during austenite decomposition in a low-alloy steel. Law et al. Materials Science and Technology, 3 (8), 642-8, 1987.

4. Claims 1, 2, 6, 7 and 8 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Law et al.

Law et al. discloses of low alloy steel having the thin films of retained interlath austenite in untransformed martensite and transformation of austenite to ferrite (See abstract top of page 642 and Introduction in col. 1 page 642). Law et al. disclose alloy compositions containing iron and carbon in a range of 0.25-0.40 % (See Table 1 in col. 2 page 642 and Figure 1). Law et al. discuss interphase precipitation of carbides during transformation of the austenite, in lath austenite-untransformed martensite, and in ferrite (See col.2 page 642 – col. 1 page 643). When discussing transformation, Law et al. disclose interlath films of retained austenite in retained martensitic areas and abutting the ferrite (See "Ferrite reaction" col.1-col. 2 page 643). Law et al. identifies no carbide precipitates at interfaces between the martensitic-austenitic phases. This is interpreted as martensitic-austenitic interfaces being devoid of carbides as in the claimed invention.

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With respect to the carbon content, Law et al.'s carbon content ranges of 0.25-0.40 wt. % (See Table 1 in col. 2 page 642) is close to the carbon content of the claimed invention of a maximum of 0.25% by weight (see Claim 1) or about 0.01% to about 0.25% by weight (see Claim 6) or about 0.03% to about 0.25% by weight (see Claim 7) or about 0.05% to about 0.2% by weight (see Claim 8). Therefore, since the claimed ranges "are close enough that one skilled in the art would have expected them to have the same properties", a prima facie case of obviousness exists (Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 Fed. Cir. 1985, See MPEP2144.05).

Allowable Subject Matter

5. Claims 3-5 and 9-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

A primary reason that Claims 3-5 contain allowable subject matter is that the prior art does not teach or suggest an alloy carbon steel comprising iron and a maximum of 0.35% by weight of carbon, said alloy carbon steel having a triple-phase microstructure comprising ferrite crystals fused with martensite-austenite crystals, said martensite-austenite crystals comprising laths of martensite alternating with thin films of austenite, in which the martensite-austenite crystals constitute from about 5% to about 95% by weight of said triple-phase microstructure.

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A primary reason that Claim 9-12 contains allowable subject matter is that the prior art does not teach or suggest an alloy carbon steel comprising iron, a maximum of 0.35% of carbon by weight of alloy carbon steel, and silicon at a concentration of about 0.1% to about 3% by weight of alloy carbon steel, said alloy carbon steel having a triple-phase microstructure comprising ferrite crystals fused with martensite-austenite crystals, said martensite-austenite crystals comprising laths of martensite alternating with thin films of austenite having triple phase microstructure comprising ferrite crystals fused with martensite-austenite crystals, said martensite-austenite crystals, comprising laths of martensite alternating with thin films of austenite.

Claim 12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art of record and not relied upon is considered pertinent to applicants disclosure.

U.S. Pat. No. 4,581,202 to Kudo et al. relates to a sintered powder stainless steel having a matrix phase of substantially single ferritic structure and a dispersing phase comprising a structure selected from the group consisting of an austenitic structure, an austenitic + dual phase structure, and an austenitic + ferritic + martensitic triple phase structure.

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JP 11350064 A2 to Omiya et al. discloses a triple phase structure of ferrite + martensite + 1-5% residual austenite (See abstract). Omiya's steel contains 0.05-0.25% of C; 2.0% or less of Si; 1.0-4.0% Mn; 0.100 % or less of P, 0.030 % or less of S, 0.010-0.150 % or less of Al; and further may contain 2.0% or less of Cr; 0.0030 or less B; and/or 1.0% or less Mo.

U.S. Pat. No. 6,066,212 to Koo et al. discloses low alloy steel with a dual phase microstructure having a first phase of essentially ferrite and a second phase of predominantly lath martensite, fine-grained lath martensite, fine-grained lower bainite, or mixtures thereof (See Col. 4 lines 10-15 and Claim 1).

Inquiries

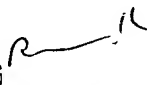
Any inquiry concerning this communication or earlier communications from the examiner should be directed to David H. LeRoy whose telephone number is 703-305-5793. The examiner can normally be reached on M-Th 7-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 872-9310 for regular communications and 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

DHL

1/23/03

ROY KING 
SUPERVISORY PATENT EXAMINER
TECHNOLOGY GROUP 1742